What is claimed is:

1. A sawtooth generator for generating a sawtooth waveform as a function of a periodic pulse coupled to said generator, comprising:

a first capacitor that is charged as a function of said periodic pulse and then discharged at a predetermined rate such that the voltage on said first capacitor defines said sawtooth waveform; and

a reference circuit for limiting the peak voltage of said sawtooth waveform as a function of a predetermined reference voltage, said reference circuit including a zener diode for generating said predetermined reference voltage in response to a predetermined bias current when said zener diode is reverse biased, a first circuit coupled between said zener diode and said first capacitor and operative to limit the peak voltage on said capacitor as a function of said predetermined voltage, and a second circuit for providing said predetermined bias current as a function of said periodic pulse such that said predetermined bias current is turned on during the time said first capacitor is being charged and off for a substantial amount of the time when said first capacitor is discharging.

2. The sawtooth generator of Claim 1, wherein said periodic pulse is generated by a zero crossing detector having two terminals to which an AC input is coupled, said detector for detecting each zero crossing of said AC input and generating said periodic pulse for each said zero crossing.

3. The sawtooth generator of Claim 1, wherein said second circuit comprises:

a first transistor having a base, an emitter coupled to ground, and a collector; said zener diode having an anode and a cathode; said collector coupled to said anode of said zener diode at a first node; said periodic pulse being coupled to said base through a first resistor such that said first transistor is switched on as a function of said periodic pulse, and

a second, third, and fourth resistor connected in series between a DC supply voltage (V_{cc}), and said first node;

wherein said predetermined bias current is provided to said zener diode as a function of said periodic pulse.

4. The sawtooth generator of Claim 3, wherein said first circuit comprises a first and second diode connected in series with said zener diode between the first node and said first capacitor at a second node, and a second capacitor connected between the junction of said first and second diodes and ground and being charged by said zener diode to said predetermined reference voltage, said second capacitor having a capacitance substantially greater than the capacitance of said first capacitor such that said second capacitor maintains said predetermined reference voltage for a predetermined period of time after the end of each said periodic pulse for limiting the peak voltage of said sawtooth waveform.

5. The sawtooth generator of Claim 4, wherein said cathode of said zener diode is connected to a cathode of said first diode at a third node, said first diode having an anode connected to a cathode of said second diode and said second diode having an anode connected to said first capacitor at said second node.

6. The sawtooth generator of Claim 3, wherein said second circuit further comprises:

a third capacitor connected in parallel across said emitter and collector of said first transistor.

7. The sawtooth generator of Claim 1, further including a second transistor having a base coupled to the junction of said second and third resistor, an emitter connected to the junction of said third and fourth resistor, and a collector coupled to said first capacitor through a fifth resistor.

8. The sawtooth generator of Claim 1, further including a constant current source for discharging said first capacitor.

9. In a sawtooth generator for generating a sawtooth waveform at an output terminal and including a first capacitor, a first circuit for charging said first capacitor to a predetermined voltage as a function of an input pulse, a second circuit for discharging said first capacitor at a controlled rate, and a third circuit for generating a voltage at said output terminal as a function of the voltage across said first capacitor, a reference circuit for limiting the peak voltage on said first capacitor comprising:

a zener diode for generating a predetermined reference voltage in response to a predetermined bias current when said zener diode is reverse biased,

a fourth circuit coupled between said zener diode and said first capacitor and operative to limit the peak voltage on said capacitor as a function of said predetermined reference voltage; and

a fifth circuit for providing said predetermined bias current as a function of said periodic pulse such that said predetermined bias current is turned on during the time said first capacitor is being charged and off for a substantial amount of the time when said first capacitor is discharging.

10. A reference circuit for providing a reference voltage during a predetermined time interval comprising:

a zener diode for providing said reference voltage in response to a predetermined bias current when said zener diode is reverse biased, and

a bias control circuit for generating said predetermined bias current only during said predetermined time interval such that said zener diode provides said reference voltage only during said predetermined time interval.